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(54) PICTURE PROCESSOR AND ELECTRONIC CAMERA

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a picture processor which can display pictures whose photographing directions are mixed lengthways and sideways on a screen in a visible display direction with a simple operation.

SOLUTION: The processor is provided with an instructing means 28 instructing the change of the direction of the displayed picture for the respective pictures, a storage means 17 storing display direction information for the respective pictures, which are instructed by the instructing means, and a picture generating means 16 generating the display picture in the direction corresponding to display direction information stored in the storage means.

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#### CLAIMS

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[Claim(s)]

[Claim 1] The image processing system characterized by to have a directions means direct modification of the sense of the image to display for every image, a storage

means memorize the display sense information for every image directed by the above-mentioned directions means, and an image creation means create a display image with the sense according to the display sense information memorized by the above-mentioned storage means.

[Claim 2] The image processing system according to claim 1 characterized by having a resetting means for resetting the display sense information memorized by the above-mentioned storage means.

[Claim 3] The above-mentioned resetting means is an image processing system according to claim 2 characterized by resetting by detecting disconnection of the lid formed in the attachment-and-detachment section of the record medium for image recording.

[Claim 4] The above-mentioned resetting means is an image processing system according to claim 2 characterized by resetting according to the power-on or power-off of a power source.

[Claim 5] The electronic camera characterized by having an image processing system according to claim 1 to 4.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates easily the sense of the image displayed on

an image processing system and an electronic camera, especially a screen to the image processing system and electronic camera which can be set up.

[0002]

[Description of the Prior Art] Since longitudinal photography is also performed besides sideways photography when taking a photograph with a camera, in-every-direction mixture of the photography sense of the image recorded on the record medium is carried out. Since it usually fixes the camera sideways on the other hand in reproducing a photography image on the LCD screen with which the electronic camera was equipped, the display sense of the image by which longitudinal photography was carried out is in the condition of having slept horizontally. Therefore, there is a problem that the image by which longitudinal photography was carried out is hard to see.

[0003] As a conventional technique relevant to such a problem, to JP,10-173984,A, the top-and-bottom detection sensor detects the sense of a camera automatically at the time of photography, and the technique of correcting the sense of an image automatically based on the detection information at the time of playback is indicated. However, there is also a problem that the sensor of the dedication for detecting the sense of a camera is required, it is difficult to miniaturize a camera, and cost goes up.

[0004] Moreover, whenever each image is displayed on a LCD screen, the method of directing modification of the display sense of an image is also considered, but in repeating and displaying the same image, it is necessary to direct modification of the display sense each time, and there is a problem that the directions actuation for it becomes complicated.

[0005] Furthermore, although recording display sense information on a record medium with the image data of a photography image is also considered, when the image file is protected, for example, it will have to be canceled, and it will be necessary to perform processing for it.

[0006]

[Problem(s) to be Solved by the Invention] Thus, when it was going to display the image in which the photography sense is carrying out in-every-direction mixture on the display screen with the legible sense, there was a problem that the problem, actuation, and processing which an exclusive sensor is required conventionally became troublesome.

[0007] This invention is made to the above-mentioned conventional technical problem, and does not need special components, but it is easy actuation and aims at offering the image processing system and electronic camera which can display on a screen the image in which the photography sense is carrying out in-every-direction mixture with the

legible display sense.

[0008]

[Means for Solving the Problem] The image processing system concerning this invention is characterized by to have a directions means direct modification of the sense of the image to display for every image, a storage means memorize the display sense information for every image directed by the above-mentioned directions means, and an image creation means create a display image with the sense according to the display sense information memorized by the above-mentioned storage means.

[0009] The desirable mode of this invention is as follows.

[0010] (1) It has a resetting means for resetting the display sense information memorized by the above-mentioned storage means.

[0011] (2) The above-mentioned resetting means resets by detecting disconnection of the lid formed in the attachment-and-detachment section of the record medium for image recording.

[0012] (3) The above-mentioned resetting means resets according to the power-on or power-off of a power source.

[0013] Moreover, the electronic camera concerning this invention is characterized by having the above-mentioned image processing system.

[0014]

[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained with reference to a drawing.

[0015] (Outline) Drawing 1 shows the image displayed on the image display LCD prepared in the tooth-back section of an electronic camera. Drawing 1 (a) the condition (it is called reference condition or an initial state) of having displayed on LCD the image by which longitudinal photography was carried out with the sense as it is Drawing 1 (b) shows the condition of drawing 1 (c) having rotated counterclockwise the condition of having rotated the image of drawing 1 (a) 90 degrees clockwise, and having displayed on LCD by predetermined actuation, 90 degrees by predetermined actuation, and having displayed the image of drawing 1 (a) on LCD. In addition, in drawing 1 (b) and drawing 1 (c), the field shown with the slash of the right-and-left both sides of a LCD screen shows the field by which blue back processing was carried out.

[0016] Looking at a LCD screen, he directs the desired display sense for every image by predetermined actuation, and is trying to memorize the display sense information on each image in this invention to each image read from attachment-and-detachment mold record media, such as a memory card, to semiconductor memory, such as the storage means with which the camera itself was equipped, for example, a flash memory etc.

That is, since the case where an image is reproduced on the screen with which the camera (image processing system) itself was equipped is assumed, he does not record on attachment-and-detachment record media, such as a memory card, by making display sense information into an image file with image data, but is trying to memorize temporarily with the storage means with which the camera itself was equipped. The memorized display sense information is automatically reset by predetermined actuation of power-on, power-off, etc.

[0017] Although the example shown in drawing 1 was an example in the case of displaying each image for every coma on a LCD screen, also when displaying the index display image which two or more images were smallness-screen-sized [ display image ], and gathered them on a LCD screen, it can apply the approach same with having mentioned above.

[0018] Drawing 2 shows the index display screen divided into the  $3 \times 3 = 9$  piece small screen. The arrow head which the figure at the upper left of each smallness screen shows the coma number, and was shown in each smallness screen shows the sense of a photographic subject. Drawing 2 (a) shows the condition that drawing 2 (c) changed the condition of drawing 2 (b) having rotated the image of a sideways display of 2 coma eye, and having changed the condition (reference condition or initial state) of having displayed each image (each coma) on LCD with the photoed sense into the longitudinal display into the longitudinal display, also about the image of the further remaining sideways display. About the method of storage of display sense information, and reset of display sense information, it is the same as that of the example shown in drawing 1.

[0019] Thus, in this invention, the display sense is directed to each image read from record media, such as a memory card, and the display sense information on each image is memorized for the storage means with which the camera itself was equipped. Therefore, even when displaying the same image repeatedly, it is not necessary to direct modification of the display sense each time. Moreover, since it is not necessarily recorded on a record medium with image data, not using display sense information as an image file, it is not necessary to perform processing in which protection of an image file is removed. Moreover, since it does not carry out rewriting some record media, it is safe. Therefore, the photography sense can display the image which is carrying out in-every-direction mixture with the legible display sense by easy actuation on the screen with which the camera was equipped.

[0020] (Equipment configuration) Drawing 3 is the block diagram having shown the configuration of the principal part of the electronic camera concerning the operation gestalt of this invention, and drawing 4 is the perspective view having shown the

appearance configuration of the electronic camera concerning the operation gestalt of this invention.

[0021] The fundamental configuration of the image pick-up section is the same as that of the usual electronic camera, and consists of an image sensor 12 which consists of optoelectric transducers, such as the taking-lens system 11 and CCD, an image pick-up circuit 13, and an A/D-conversion circuit 14. That is, the picture signal (image data) by which digital conversion was carried out is acquired by carrying out photo electric conversion of the photographic subject image in which image formation was carried out by the taking-lens system 11 with an image sensor 12, and inputting into the A/D-conversion circuit 14 the picture signal by which photo electric conversion was carried out through the image pick-up circuit 13.

[0022] Each part of an electronic camera is connected by the bus 15, RISC-CPU is used as Main CPU 16 which controls each part of an electronic camera, and the program for control is stored in the flash memory 17. Moreover, modification processing of the display sense of each image is performed by Main CPU 16, and the display sense information on each image is memorized at a flash memory 17. Moreover, the factive CPU 18 is connected to the bus 15, and control of the input from the control unit 28 mentioned later is performed.

[0023] Have a function as buffer memory, and image data is memorized temporarily, and also SDRAM19 is used as a working area of various processings, such as an image processing. The image-processing section 20 is for performing a predetermined image processing to a photography image, and the JPEG section 21 is for performing JPEG compression / elongation processing to image data.

[0024] The Records Department 22 is for recording the image data by which JPEG compression processing was carried out on attachment-and-detachment mold record media, such as a memory card. The lid opened into it in case a record medium is discharged into the part (insertion section of a record medium) which detaches and attaches the record medium of the Records Department 22 is formed, and disconnection of this lid is detected by the pilot switch 23. When disconnection of a lid is detected by this pilot switch 23, the display sense information on each image memorized by the flash memory 17 is reset.

[0025] Image display LCD 24 is formed in the tooth-back side of a camera, and image display LCD 24 drives by the LCD driver 25. On this image display LCD 24, an index display image as shown in drawing 2 besides 1 coma display image as shown in drawing 1 is displayed. An external interface (I/F) 26 and the external output terminal 27 are for supplying various information, such as image information, to an external

device.

[0026] The control unit 28 is constituted by the various actuation switches of mode dial 28a, release carbon button 28b, cross-joint carbon button 28c, and display sense modification carbon button 28d1 - 28d3 grade as shown in [drawing 4](#).

[0027] Mode dial 28a performs selection in ON of a power source / various modes [ it is off and also ], such as photography mode and a playback mode, by rotation actuation of a dial. Release carbon button 28b is used for the usual photography directions actuation. Cross-joint carbon button 28c is used for coma delivery / coma return actuation of each image in 1 coma display mode, and also it is used for selection actuation of each image displayed on the index screen with an index display mode.

[0028] Display sense modification carbon button 28d1-28d3 are used in case the display sense of each image displayed on image display LCD 24 is changed. If this function of display sense modification carbon button 28d1-28d3 is explained using [drawing 1](#), in display sense modification carbon button 28d1, display sense modification carbon button 28d2 correspond to [drawing 1](#) (b), and display sense modification carbon button 28d3 correspond to [drawing 1](#) (a) at [drawing 1](#) (c), respectively. For example, in rotating an image 90 degrees counterclockwise in making it rotate 90 degrees clockwise and changing an image like [drawing 1](#) (b) to the standard image of [drawing 1](#) (a), and changing modification carbon button 28d2 like [drawing 1](#) (c), it pushes modification carbon button 28d3. In returning the image of [drawing 1](#) (b) or [drawing 1](#) (c) to the standard image of [drawing 1](#) (a), it pushes modification carbon button 28d1. Moreover, in changing the image of [drawing 1](#) (b) like [drawing 1](#) (c) and changing the image of [drawing 1](#) (c) for modification carbon button 28d3 like [drawing 1](#) (b), it pushes modification carbon button 28d2.

[0029] (Actuation) The example of this operation gestalt of operation is hereafter explained with reference to the flow chart shown in [drawing 5](#) - [drawing 8](#).

[0030] First, if mode dial 28a performs power-on (S11), the display sense information on each image memorized by the flash memory 17 will be reset (S12). In addition, although display sense information is reset by power-on in this example, you may make it reset display sense information by power-off. After setting up a playback mode by mode dial 28a (S13), closing motion of the lid (card lid) of the Records Department 22 and decision of the existence of wearing of a record medium (memory card), i.e., decision whether it is equipped with the memory card proper, are made (S14, S15).

[0031] Then, 1 coma display mode or an index display mode is judged (S16), when it is an index display mode, processing of the index display mode mentioned later is performed (S17), and the following processings are performed when it is 1 coma



display mode.

[0032] First, the display sense information on an assignment coma (a default is a sideways display) is read from a flash memory 17 (S18), and the display image of an assignment coma is created according to the read display sense information (S19).

[0033] It explains using the flow chart which showed the detail of this step of S19 to drawing 6. First, the image data of an assignment coma is read from a memory card (S41), and elongation processing is performed to the read image data (S42). Then, based on the display sense information read from the flash memory 17, directional change processing is performed to the image data by which elongation processing was carried out if needed (S43). Furthermore resizing processing is performed, and when the display sense is longitude, blue back processing is performed to the both sides of an image (S44).

[0034] Thus, the display image of an assignment coma is created and the created image is displayed on image display LCD 24 (S20). In the condition after reset, since the default of display sense information serves as sideways, on image display LCD 24, a sideways display as shown in drawing 1 (a) is performed. Moreover, when the display sense is changed into longitude at the step of S22 mentioned later, on image display LCD 24, a longitudinal display as shown in drawing 1 (b) is performed.

[0035] A user looks at the image displayed on image display LCD 24, judges whether the display sense is changed (S21), and when modification is required, he changes the display sense (S22).

[0036] It explains using the flow chart which showed the detail of this step of S22 to drawing 7. First, the desired display sense is chosen using display sense modification carbon button 28d1-28d3 (S51). Then, directional change processing according to the selected display sense is performed (S52), and the image (for example, image as shown in drawing 1 (b)) by which directional change processing was carried out is displayed on image display LCD 24 (S53). Furthermore, the changed display sense information is memorized by the flash memory 17 (S54).

[0037] When the card lid of the Records Department 22 is wide opened by discharge of a memory card etc., the display sense information memorized by (S23) and the flash memory 17 is reset (S24), and returns to the step of S14. Moreover, although (S25) and predetermined power-off processing are made when power-off is carried out (S26), you may make it reset the display sense information memorized by the flash memory 17 by this power-off, as stated previously.

[0038] When actuation of coma modification directions, i.e., coma delivery, or coma return is made by cross-joint carbon button 28c, it returns to the step of S18 by making

(S27), its degree, or a coma before that into an assignment coma.

[0039] Next, the detail of the index display mode of S17 is explained with reference to the flow chart shown in drawing 8.

[0040] First, the display sense information on each coma by which it is indicated by the index is read from a flash memory 17 on image display LCD 24 (S61), an index display image is created according to the display sense information on each read coma (S62), and the created index display image is displayed on image display LCD 24 (S63). In the condition after reset, since the default of the display sense information on each coma serves as sideways, on image display LCD 24, the image of an initial state as shown in drawing 2 (a) is displayed.

[0041] The display sense of the coma which the user looked at the index display image displayed on image display LCD 24, specified the coma which changes the display sense by cross-joint carbon button 28c (S64), and was further specified using display sense modification carbon button 28d1-28d3 is chosen (S65). Thus, while an index display image is corrected according to the specified display sense (S66), the display sense information on the changed coma is memorized by the flash memory 17 (S67), and the modified index display image is displayed on image display LCD 24 (S68). For example, when the sideways display of 2 coma eye shown in drawing 2 (a) is changed into a longitudinal display, an index display image as shown in drawing 2 (b) is obtained.

[0042] When the card lid of the Records Department 22 is wide opened by discharge of a memory card etc., the display sense information memorized by (S69) and the flash memory 17 is reset (S70), and returns to the step of S14 shown in drawing 5. Moreover, although (S71) and predetermined power-off processing are made when power-off is carried out (S72), you may make it reset the display sense information memorized by the flash memory 17 by this power-off, as stated previously.

[0043] When the modification directions to other coma on an index screen are made by cross-joint carbon button 28c, the same processing is repeated to return and the coma with which modification directions were made to the step of (S73) and S64. Thus, an index display image as finally shown in drawing 2 (c) is obtained.

[0044] As mentioned above, although the operation gestalt of this invention was explained, it is possible for this invention to deform within limits which are not limited to the above-mentioned operation gestalt and do not deviate from the meaning variously, and to carry out. Furthermore, invention of various phases is included in the above-mentioned operation gestalt, and various invention may be extracted by combining the indicated requirements for a configuration suitably. For example, even if

some requirements for a configuration are deleted from the indicated requirements for a configuration, if predetermined effectiveness is acquired, it may be extracted as invention.

[0045]

[Effect of the Invention] According to this invention, the display sense is directed for every image, and since the directed display sense information is memorized, even if the photography sense is the image which is carrying out in-every-direction mixture, it becomes possible to display each image with the suitable display sense by easy actuation.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] Drawing for explaining the outline of the operation gestalt of this invention.

[Drawing 2] Drawing for explaining the outline of the operation gestalt of this invention.

[Drawing 3] The block diagram having shown the example of a configuration of the principal part of the electronic camera concerning the operation gestalt of this invention.

[Drawing 4] The perspective view having shown the example of an appearance configuration of the electronic camera concerning the operation gestalt of this invention.

[Drawing 5] The flow chart which showed the example of the electronic camera concerning the operation gestalt of this invention of operation.

[Drawing 6] The flow chart which showed the detail about a part of flow chart shown in drawing 5.

[Drawing 7] The flow chart which showed the detail about a part of flow chart shown in drawing 5 .

[Drawing 8] The flow chart which showed the detail about a part of flow chart shown in drawing 5 .

[Description of Notations]

- 11 -- Taking-lens system
- 12 -- Image sensor
- 13 -- Image pick-up circuit
- 14 -- A/D-conversion circuit
- 15 -- Bus
- 16 -- Main CPU
- 17 -- Flash memory
- 18 -- Factice CPU
- 19 -- SDRAM
- 20 -- Image-processing section
- 21 -- The JPEG section
- 22 -- Records Department
- 23 -- Pilot switch
- 24 -- Image display LCD
- 25 -- LCD driver
- 26 -- External interface
- 27 -- External output terminal
- 28 -- Control unit
- 28a -- Mode dial
- 28b -- Release carbon button
- 28c -- Cross-joint carbon button
- 28d1-28d3 -- Display sense modification carbon button